

Code No: 111AD**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD****B.Tech I Year Examinations, May/June - 2019****ENGINEERING PHYSICS****(Common to CE, EEE, ME, ECE, CSE, EIE, IT, MCT, ETM, MMT, AE, AME, MIE, PTM, AGE)****Time: 3 hours****Max. Marks: 75****Note:** This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART- A**(25 Marks)**

- 1.a) What is Ionic Bond? [2]
- b) What is Hydrogen Bond? [3]
- c) Write two important properties of Matter Waves. [2]
- d) What is the main difference between Micro Canonical and Canonical Ensembles? [3]
- e) What is Polarizability? [2]
- f) What is the Magnetization? [3]
- g) Write applications of lasers. [2]
- h) Define Numerical Aperture. [3]
- i) Explain about top down approach for synthesis of nanomaterials. [2]
- j) What is Sabine's Formula? Explain. [3]

PART-B**(50 Marks)**

- 2.a) What is packing fraction? Deduce packing factor for BCC structure.
 - b) Write notes on Frenkel and Schottky defects with diagrams. [5+5]
- OR**
- 3.a) Explain with suitable examples the covalent and metallic type of bondings in solids.
 - b) Write a note with neat diagram of Structure of Diamond. [5+5]
- 4.a) Derive an expression for Schrödinger's Time Independent Wave Equation.
 - b) Describe Concept of Effective Mass of an Electron. [5+5]
- OR**
- 5.a) Write an essay on Davisson and Germer's Experiment.
 - b) Explain Origin of Energy Band Formation in Solids. [5+5]

- 6.a) Derive an expression for electronic polarizability in terms of the radius of the atom.
b) Write short notes on piezoelectricity. [5+5]
- OR**
- 7.a) Write notes on Type-I and Type-II Superconductors along with the applications of Superconductors.
b) Discuss about Meissner Effect. [5+5]
- 8.a) Discuss about Diffraction grating experiment with the help of diagram.
b) Write short notes on Nicol prism. [5+5]
- OR**
- 9.a) Write an essay on construction and working of Helium-Neon Laser.
b) What is the importance of the Attenuation in Optical Fibers? [5+5]
- 10.a) Write an essay on Chemical Vapour Deposition.
b) Discuss about Solar cell, LED and Photo Diodes. [5+5]
- OR**
- 11.a) What are the factors affecting the architectural acoustics and suggest their remedies.
b) Write notes on Quantum Confinement. [5+5]

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